

CRETACEOUS FRESHWATER BIVALVES FROM QUEENSLAND

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Three new freshwater unioids are described from the Griman Creek and Winton Formations. *Protovirgus wintonensis* sp. nov. is a medium-sized elongate unioid with the anterior adductor muscles raised on a platform. *Prohyria macmichaeli* sp. nov. is characterised by its more anteriorly placed umbones and its less robust form in comparison to other members of the genus. *Velesunio goondiwindiensis* sp. nov. is small, elongate-ovoid with finer growth lines than most members of the genus. All three taxa range from middle Albian to Cenomanian. □ *Unionida*, *Prohyria*, *Protovirgus*, *Velesunio*, *Winton Fm.*, *Griman Creek Fm.*

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Collections made from the middle Cretaceous Winton and early Cretaceous Griman Creek Formations have yielded three new taxa; *Protovirgus wintonensis* sp. nov., *Prohyria macmichaeli* sp. nov. and *Velesunio goondiwindiensis* sp. nov. The Griman Creek Fm. (Exon & Senior, 1976) is a non-marine to brackish unit which outcrops in the Surat Basin. It is considered to be of middle Albian age by Burger (1986, 1995) who placed the unit within the *Coptospora paradoxa* Zone. The younger Winton Fm. out-crops extensively within the central and southwestern Eromanga Basin being of latest Albian to Cenomanian age and is, except for its extremities, a bare and exclusively freshwater deposit, comprising lacustrine and fluvial siliciclastic sediments. McLoughlin et al. (1995) described the Cenomanian flora from the Winton Fm. Localities are prefixed QML and are detailed in the appendix.

Newton (1915) erected *Unio whitecliffsensis* and *Unio jaqueti* respectively from the Coreena Fm. of White Cliffs and the Griman Creek Fm. of Lightning Ridge. McMichael (1956) revised this material and assigned *U. jaqueti* to *Velesunio* and *U. whitecliffsensis* to *Hyridella*. The two specimens figured by Dettman et al. (1992) are here assigned to *Velesunio goondiwindiensis* (Dettmann et al., 1992: 244, Fig 19(j)) and *Protovirgus wintonensis* (Dettmann et al., 1992: 244, Fig 19(i)).

List of Cited Localities. QML229: Mueller Range, west of Cork Station, near Winton, CWQ, Winton Formation, Cenomanian. QML379: Franklin Station, "Trevor Cluff's" locality in paddock west of Mt Gideon below small tabletops and west on flats towards hills, near Winton, CWQ, Winton Formation, Cenomanian. QML570: Te Apiti Stn, NW of Goondiwindi,

SEQ, Dam site. Griman Creek Formation. Late Albian.

SYSTEMATIC PALAEOLOGY

Phylum MOLLUSCA

Class BIVALVIA

Order UNIONOIDA Stoliczka, 1871

Family MUTELIDAE Gray, 1847

Protovirgus McMichael, 1956

Protovirgus wintonensis sp. nov.
(Fig 1. A-E)

Unioid, Dettmann et al. 1992: 244, fig. 19(i).

ETYMOLOGY. For the town of Winton.

MATERIAL EXAMINED. HOLOTYPE: QMF-34635, L379; Franklin Stn. Trevor Cluff's locality, Mt Gideon. PARATYPES: QMF5681-5682, QMF34645, QMF34646 from QML570; QMF34634, QMF34644, QMF34647, QMF34648 from QML379.

DIAGNOSIS. Small to medium-sized, equivalved, elongate unioid with slightly inflated umbones and fine, comarginal ornament. Hinge straight; anterior adductor muscle raised on platform. Tapering fairly strongly with well-rounded posterior margin.

DESCRIPTION. Maximum height ranges from 27-34mm, width 19-30mm and length 70-80mm (Table 1). Shell elongate, hinge straight, ligament thin, extending approximately 2/3 of shell length. Fine comarginal ornament of growth lines. Rounded posterior margin. Beak unsculptured. Shell thin. Anterior adductor muscle positioned behind umbo, raised on platform. Posterior muscle scar unknown. Dentition unknown.

REMARKS. The tapering form, sharp ventral margins and strongly anterior umbones are typical of *Protovirgus*. The type species, *P. dunstani* (Ehridge Jr 1888, described by McMichael, 1956: 232, fig. 8) from the Triassic of NSW is approximately half the length and much more linguiform than *P. wintonensis*. *P. flemingi* McMichael (1956: 232-233, fig. 1-3) from the Cretaceous of New Zealand is approximately two-thirds the size, and the umbones are placed more posteriorly than in *P. wintonensis*. *P. jaenschi* Ludbrook, 1961 from the Triassic of SA is slightly larger at 80mm long, 31mm high, and has a less developed muscle scar and is more ovate than *P. wintonensis*. *P. jaenschi* has an inflexion in the posterior 1/3 which is not seen in *P. wintonensis*. *P. coatsi* Ludbrook, 1961 from the Triassic of Leigh's Creek is smaller (two-thirds the length) with more concave ventral and convex dorsal margins. *P. clellandi* Hocknull, 1994 from the Triassic of Ipswich, south-east Queensland is much larger, the holotype being 123mm long and 39mm high, and is sharper posteriorly with greater inflation of the umbones.

Prohyria McMichael, 1956

Prohyria macmichaeli sp. nov.
(Fig. 1. F-H, Fig. 2. A-C)

ETYMOLOGY. For Donald F. McMichael for his studies of freshwater bivalves.

MATERIAL EXAMINED. HOLOTYPE: QMF34636, QML379; Franklin Stn. Trevor Cluff's locality, Mt. Gideon. PARATYPES: QMF5677 from QML570 and QMF34637 from QML379, QMF34638 from QML229.

DIAGNOSIS. Medium-sized, equivalved unioid, ovate, rugose ornament, umbones anterior and inflated, beak slightly sculptured, shell thick.

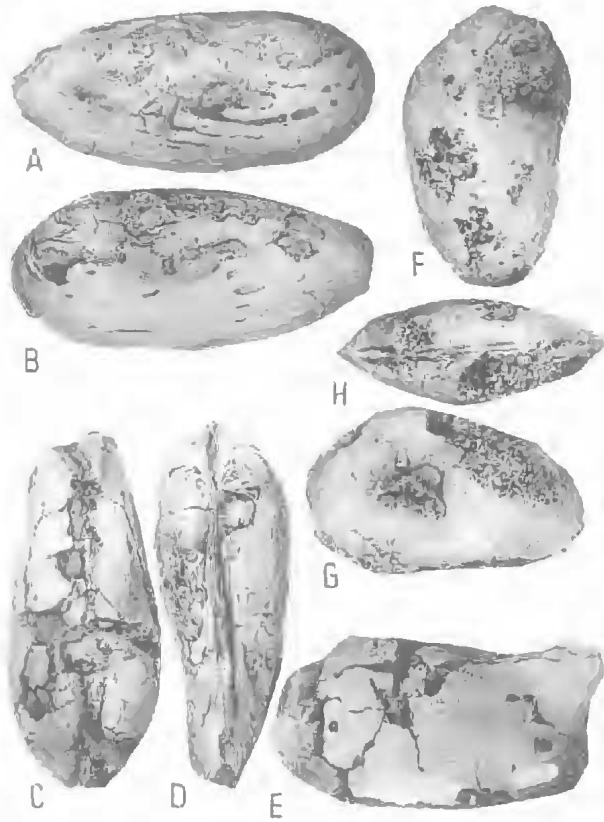


FIG. 1. A-E, *Protovirgus wintonensis* sp. nov. A-C, Holotype QMF34635, x 1.2 (A, right valve; B, left valve; C, dorsal view). D, E, Paratype QMF34634, internal mold x 1.2 (D, dorsal view; E, left valve). F-H, *Prohyria macmichaeli* sp. nov. Paratype QMF34638 x 1.2 (F, right valve; G, left valve; H, dorsal view).

DESCRIPTION. Maximum height 32mm, width 27mm and in length 55mm (Table 2). Elongate-ovate, umbones anterior and inflated. Anterior margin convex, ornament rugose, beak slightly

TABLE 1. Morphometric data for specimens of *Protovirgus wintonensis* sp. nov. from the Winton and Griman Creek Formations. Measurements in mm.

Specimen	Height	Length	Width
QMF34635	27	70	25
QMF34636	30	75	25
QMF34644	34	82	30
QMF34645	25	50	20
QMF34646	22	54	19
QMF34647	30	73	27
QMF34648	33	75	25
QMF5682	17	38	14
QMF5681	19	47	16

sculptured. Hinge straight, short. Shell thick, ligament short, and thick. Escutcheon relatively broad, anterior adductor muscle small, raised slightly and orientated anteroventrally. Dentition unknown.

REMARKS. The anteriorly placed, inflated umbones, rugose ornament, elongate-ovoid shape ally the present material to *Prohyria*. The type species, *P. johnstoni* (Ethridge Jr, 1881) of McMichael (1956: 227-228, figs 6&7) from the Oligocene of Tasmania is much larger, up to 126mm long, wider (up to 55mm) and the dorsal margin is sharper. *P. eyrensis* (Etheridge, 1892) of McMichael (1956: 228-230, figs 8-12) from the Triassic of Leigh's Creek, South Australia is also longer (up to 102mm), wider (up to 50mm), and umbones are placed more posteriorly than *P. macmichaeli*.

Velesunio Iredale, 1934

Velesunio goondiwindiensis
sp. nov.
(Fig. 2. D-J.)

Unioïd, Dettmann et al. 1992: fig. 19j.

ETYMOLOGY. For the town of Goondiwindi.

MATERIAL EXAMINED. HOLOTYPE: QMF5684, from QML570; Dam at 'Te Apiti' Stn., near Goondiwindi, SEQ. PARATYPES: QMF5683, QMF5685, QMF5686, QMF34639-34641 from QML570.

DIAGNOSIS. Small, elongate-ovoid, fine comarginal ornament and thin shell. Umbones anterior. Anterior adductor muscles small, elongate, raised slightly. Shell expanded posteroventrally.

DESCRIPTION. Small, equivalved unioïd. Elongate-ovoid, compressed with fine comarginal ornament. Maximum height ranges 33-35mm, width 16-18mm and length 35-38mm (Table 3). Umbones placed anteriorly, at anterior 1/3 of total length. Beak sculptured but small. Dorsal and

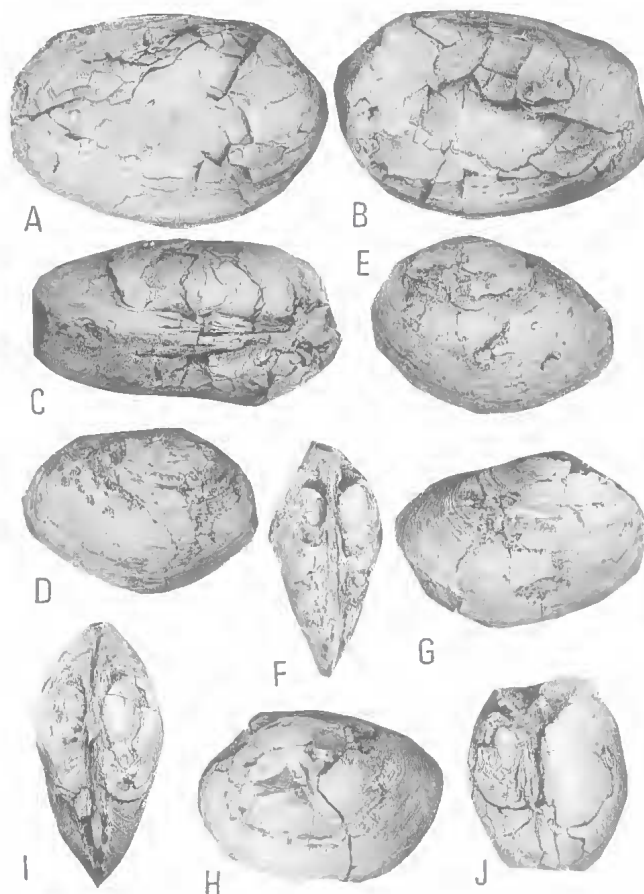


FIG. 2. A-C, *Prohyria macmichaeli* sp. nov. Holotype QMF34637, x 1.2 (A, right valve; B, left valve; C, dorsal view). D-J, *Velesunio goondiwindiensis* sp. nov. D-F, Paratype QMF34639, x 1.2 (D, right valve; E, left valve; F, dorsal view). G-I, Holotype QMF5684, x 1.2 (G, right valve; H, left valve; I, dorsal view). J, Paratype QMF34640, x 1.2, dorsal view.

ventral margins run subparallel, forming an expanded posterior. Hinge 1/2 the length of total. Ligament thin, escutcheon narrow. Maximum height posterior to umbones. Adductor muscle scars small, elongate and orientated anteroventrally. Dentition unknown.

REMARKS. The elongate-ovoid, anteriorly placed umbones with subparallel dorsal and ven-

TABLE 2. Morphometric data for the specimens of *Prohyria macmichaeli* sp. nov. from the Winton and Griman Creek Formations.

Specimen	Height	Length	Width
QMF34636	27	48	23
QMF34637	32	55	27
QMF34638	28	50	20

TABLE 3. Morphometric data for the specimens of *Velesunio goondiwindiensis* sp. nov. from the Winton and Grimman Creek Formations. Measurements in mm.

Specimen	Height	Length	Width
QMF5683	22	22	15
QMF5684	26	35	18
QMF5685	23	29	13
QMF5686	22	31	15
QMF34639	24	36	15

tral borders expanding posteriorly indicate *Velesunio* Iredale, 1934, *V. jaqueti* (Newton, 1915) of McMichael (1956: 240) from the Grimman Creek Formation of Lightning Ridge is larger, more elongate (37-42mm long) and narrow (12-15mm) with umbones placed more posteriorly than *V. goondiwindiensis*. All recent species of *Velesunio* are much larger, more robust and have a more pronounced winged posterior (McMichael & Hiscock, 1958) than *V. goondiwindiensis*.

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